

CLAIMS

What is claimed is:

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1. A sensor system for viewing light energy from a scene, comprising:
a detector which converts incident light energy into an electrical signal, the
detector including an imaging detector array;
an optical train that focuses the light energy of the scene; and
5 an optical fiber bundle having an input end that receives the scene from the
optical train and an output end that directs the energy of the scene onto the
detector array, the optical fiber bundle comprising a plurality of optical fibers
wherein each fiber has an input shape and size at its input end and an output shape
and size at its output end, the output shape and size being different from the input
10 shape and size.
2. The sensor system of claim 1, wherein the sensor system further
includes
a color filter positioned between the scene and the detector.
3. The sensor system of claim 1, wherein the input shape of each fiber
is substantially in the form of a rectangle and the output shape is substantially in
the form of a square.
4. The sensor system of claim 1, wherein the fiber input size of each
respective optical fiber is larger than the fiber output size of that optical fiber.
5. The sensor system of claim 1, wherein the sensor system further
includes
an electronic device operable to read the electrical signal of the detector,
and
image-processing electronics.

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7. A sensor system for viewing light energy from a scene, comprising:
an imaging detector which converts incident light energy into an electrical signal, the imaging detector having
a first-color region, and
a second-color region;
a first-color imaging system comprising:
a first-color filter positioned between the scene and the first-color region of the imaging detector,
a first-color optical train that focuses first-color scene energy onto the first-color region of the imaging detector, and
a first-color optical fiber bundle having a first-color input end that receives the first-color scene energy from the first-color optical train and a first-color output end that directs the first-color scene energy onto the first-color region of the imaging detector, the first-color optical fiber bundle comprising a plurality of first-color optical fibers wherein each of the first-color optical fibers has a first-color fiber input shape and size at its first-color input end and a first-color output shape and size at its first-color output end, the first-color output shape and size being different from the first-color input shape and size; and
a second-color imaging system comprising:
a second-color filter positioned between the scene and the second-color region of the imaging detector,
a second-color optical train that focuses second-color scene energy onto the second-color region of the imaging detector, and
a second-color optical fiber bundle having a second-color input end that receives the second-color scene energy from the second-color optical train and a second-color output end that directs the second-color scene energy onto the second-color region of the imaging detector, the second-color optical fiber bundle comprising a plurality of second-color optical fibers wherein each of the second-color optical fibers has a second-color fiber input shape and size at its second-

30 color input end and a second-color output shape and size at its second-color output end, the second-color output shape and size being different from the second-color input shape and size.

8. The sensor system of claim 7, wherein
the first-color region of the imaging detector is sensitive to light energy that passes through the first-color filter and light energy that passes through the second-color filter, and

5 the second-color region of the imaging detector is sensitive to light energy that passes through the first-color filter and light energy that passes through the second-color filter.

9. The sensor system of claim 7, wherein the first-color region and the second-color region are in the same plane.

10. The sensor system of claim 7, wherein each first-color fiber has its first-color fiber input shape substantially in the form of a rectangle and its first-color fiber output shape is substantially in the form of a square.

11. The sensor system of claim 7, wherein each second-color fiber has its second-color fiber input shape substantially in the form of a rectangle and its second-color fiber output shape is substantially in the form of a square.

12. The sensor system of claim 7, wherein the first-color fiber input size of the first-color optical fibers is larger than the first-color fiber output size of the first-color optical fibers.

13. The sensor system of claim 7, wherein the second-color fiber input size of the second-color optical fibers is larger than the second-color fiber output size of the second-color optical fibers.

14. The sensor system of claim 7, wherein the sensor system further

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includes

an electronic device operable to read the electrical signal of the imaging detector, and

5 image-processing electronics.

15. The sensor system of claim 7, wherein the first-color scene energy from the first-color optical train is mapped nonlinearly onto the first-color region of the imaging detector.

16. A sensor system for viewing scene energy, comprising:
an imaging detector which converts incident light energy into an electrical signal, the imaging detector having a first-color region and a second-color region;
a first-color imaging system comprising:

5 a first-color filter positioned between the scene and the first-color region of the imaging detector;

a first-color optical train that focuses first-color scene energy onto the first-color region of the imaging detector, and

10 a first-color optical fiber bundle having a first-color input end that receives the first-color scene energy from the optical train and a first-color output end that directs the first-color scene energy onto the first-color region of the imaging detector, wherein the first-color scene energy is mapped nonlinearly onto the first-color region of the imaging detector, the first-color optical fiber bundle comprising a plurality of first-color optical fibers wherein each of the first-color
15 optical fibers has a first-color fiber input shape and size at its first-color input end and a first-color output shape and size at its first-color output end, the first-color output shape and size being different from the first-color input shape and size;

a second-color imaging system comprising:

20 a second-color filter positioned between the scene and the second-color region of the imaging detector;

a second-color optical train that focuses second-color scene energy onto the second-color region of the imaging detector, and

a second-color optical fiber bundle having a second-color input end

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image-processing electronics.

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